



COPY OF PAPERS
ORIGINALLY FILED

RECEIVED

Marked Version of Specification Showing Location Of Changes
FEB 28 2002

On page 6,

TECHNOLOGY CENTER R3700

line 29, change "Figure 1B" to --Figure 2B--.

--Figures 2C and 2D are schematic cross sectional views of the interconnect contact of [Figure 1B] Figure 2 electrically engaging a bumped contact on a component;--

On page 13,

line 28, change "46A" to --46B--;

line 31, change "46A" to --46B--;

line 33, change "46A" to --46B--.

--As shown in Figure 3D, the leads 22B also include an outer layer [46A] 46B, which comprises a material selected to provide a non-bonding surface for the bumped contacts 16. For example, for bumped contacts 16 formed of solder, the outer layer [46A] 46B can comprise a metal that is not solder wettable. Suitable metals include Ti, TiSi₂ and Al. Rather than metal, the outer layer [46A] 46B can comprise a conductive polymer selected to provide a non-bonding surface. Suitable conductive polymers include carbon films and metal filled silicone.--

On page 15,

line 29, change "set" to --wet--.

--Next, as shown in Figure 5B, for etching the blades 28A, a mask 56A, such as a hard mask, or a resist mask, is formed on the metal layer 54A. The blades 28A can be etched using a suitable wet etchant and a [set] wet etch process. Alternately, a dry etch process such as plasma etching, ion milling or reactive ion etching can be employed. As another alternative, the blades 28A can be formed by depositing a rough metal layer using an electrolytic plating process.

Such a process is described in U.S. Patent No. 5,487,999, which is incorporated herein by reference. A representative height of the blades 28A can be from 5000Å to 50µm or more. Following formation of the blades 28A, the mask 56A is stripped.--

On page 19,

line 2, change "14B" to --12B--;

line 17, change "14B" to --12B--;

line 25, change "14B" to --12B--.

--Referring to Figures 7A-7I, steps in a method for fabricating the interconnect 10 (Figure 1) with the second embodiment contact 14B are illustrated. Initially the substrate [14B] 12B, insulating layer 24B and metal layer 54B are formed substantially as previously described for Figure 5A.

Next, as shown in Figure 7B, blades 28B are formed also as previously described. In addition, the non-bonding outer layer 46A can be formed on the metal layer 54B using a suitable deposition process such as CVD, electrodeposition deposition, or electroless deposition of a metal or conductive polymer layer.

Next, as shown in Figure 7C, the leads 22B are formed using an etching process as previously described. In addition, as shown in Figure 7H, the connecting segment 40B for the leads 22B can be formed during the same etching process.

Next, as shown in Figure 7D, an opening 64B is formed through the connecting segment 40B and through the substrate [14B] 12B. One method for forming the opening 64B is with a laser machining process. A suitable laser machining apparatus for forming the opening 64B is manufactured by General Scanning of Sommerville, MA and is designated a Model No. 670-W. Another suitable laser machining apparatus is manufactured by Synova S.A., Lausanne, Switzerland.

A representative diameter of the opening 64B can be from 10 μ m to 2 mils or greater. A representative fluence of a laser beam for forming the opening 64B with the substrate [14B] 12B comprising silicon and having a thickness of about 28 mils, is from 2 to 10 watts/per opening at a pulse duration of 20-25 ns and at a repetition rate of up to several thousand per second. The wavelength of the laser beam can be a standard infrared or green wavelength (e.g., 1064 nm-532 nm), or any wavelength that will interact with and heat silicon. Following formation of the opening 64B, the electrically insulating layer 24B can also be formed in the opening. The insulating layer 24B can comprise an insulating material,--

On page 20, line 34, change "14B" to --12B--.

--At the same time the conductive material 66A is deposited in the opening 64B, the contact pad 38B can be formed on the substrate [14B] 12B. A suitable mask (not shown) can be used during deposition of the conductive material 66A to form the contact pad 38B with a desired thickness and peripheral shape. Alternately, the contact pad 38B can comprise a different material than the conductive material 66A formed using a separate deposition or metallization process. For example, the contact pad 38B can comprise a wire bondable or solderable metal such as copper or aluminum, while the conductive material 66A can comprise a material such as nickel.--

On page 21, line 11, change "14B" to --12B--.

--Next, as shown in Figure 7F, the recess 20B can be etched in the substrate [14B] 12B, substantially as previously described for recess 20A (Figure 5F). As shown in Figure 7I, the connecting segment 40B encircles the recess 20B and the leads 22B cantilever over the recess 20B.--

On page 24,
line 30, change "test circuitry 100" to --test
circuitry 98--.

--The interconnect 10A also include terminal contacts 84 attached to the contact pads 38D. The terminal contacts 84 comprise metal balls soldered, or otherwise bonded, to the contact pads 38D. Alternately other types of terminal contacts such as pins, flat pads, or shaped wires can be employed. The terminal contacts 84 are adapted to electrically engage mating electrical connectors (not shown) on a test apparatus 96 (Figure 9A), such as a burn-in board. The test apparatus 96 includes, or is in electrical communication with test circuitry 98, adapted to apply test signals to the integrated circuits contained on the components 18A, and to analyze the resultant signals. The test carrier 80, test apparatus 96, and [test circuitry 100] test circuitry 98 form a test system 100 (Figure 9A).--